



Department of Defense DIRECTIVE

NUMBER 5000.59

January 4, 1994

Certified Current as of December 1, 2003

Incorporating Change 1, January 20, 1998

USD(A&T)

SUBJECT: DoD Modeling and Simulation (M&S) Management

- References:
- (a) Deputy Secretary of Defense Memorandum, "Modeling and Simulation Management Plan," June 21, 1991 (hereby canceled)
 - (b) Under Secretary of Defense for Acquisition *and Technology* Memorandum, "Establishment of the Defense Modeling and Simulation Office (DMSO)," July 22, 1991 (hereby canceled)
 - (c) DoD 5025.1-M, *"DoD Directives System Procedures," August 1994*
 - (d) DoD Directive 5000.1, "Defense Acquisition," *March 15, 1996*
 - (e) through (l), see enclosure 1

1. PURPOSE

This Directive:

- 1.1. Supersedes references (a) and (b).
- 1.2. Establishes DoD policy, assigns responsibilities, and prescribes procedures for the management of M&S.
- 1.3. Establishes the DoD Executive Council for Modeling and Simulations (EXCIMS).
- 1.4. Establishes the Defense Modeling and Simulation Office (DMSO).
- 1.5. *Authorizes the publication of a "DoD Modeling and Simulation Glossary" as a DoD Manual in accordance with reference (c).*

2. APPLICABILITY AND SCOPE

This Directive applies to:

2.1. The Office of the Secretary of Defense (OSD), the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Inspector General of the Department of Defense, the Defense Agencies, and the DoD Field Activities (hereafter referred to collectively as "the DoD Components").

2.2. All DoD M&S applications used after the effective date of this Directive.

3. DEFINITIONS

Terms used in this Directive are defined in enclosure 2.

4. POLICY

It is DoD policy that:

4.1. A management and administrative structure for improving the oversight, coordination, and communication of DoD M&S issues shall be established.

4.2. A coordinated DoD M&S Master Plan shall be developed.

4.3. A coordinated DoD M&S Investment Plan shall be developed.

4.4. Investments shall promote the enhancements of DoD M&S technologies in support of operational needs and the acquisition process; develop common tools, methodologies, and databases; and establish standards and protocols promoting the internetting, data exchange, open system architecture, and software reusability of M&S applications. Those standards shall be consistent with current national, Federal, DoD-wide and, where practicable, international standards for open systems.

4.5. A M&S Information Analysis Center shall be established.

4.6. Common and general-use M&S applications (such as terrain, environmental, or common manufacturing process representations) shall be assigned to a specific DoD Component for management responsibility. The DoD Component with that responsibility shall be designated the "DoD M&S Executive Agent" for that application.

The Executive Agent shall provide the application to the other DoD Components or will make provision for supporting DoD Component acquisition program milestones requiring the application. Designated M&S Executive Agents shall be responsive to the direction of the Under Secretary of Defense for Acquisition *and Technology* (*USD(A&T)*) in the execution of this responsibility.

4.7. The DoD Components shall establish verification, validation, and accreditation (VVA) policies and procedures for M&S applications managed by the DoD Component. The "DoD M&S Executive Agent" shall establish VVA procedures for that application.

4.8. M&S applications used to support the major DoD decision-making organizations and processes (such as the Defense Planning and Resources Board; the Defense Acquisition Board; the Joint Requirements Oversight Council; and the DoD Planning, Programming, and Budgeting system (references (*d*) through (*g*))) shall be accredited for that use by the DoD Component for its own forces and capabilities.

4.9. The DoD Components shall implement a M&S management system for oversight of their own M&S activities, and for coordinating and communicating DoD M&S issues.

4.10. Each DoD Component shall be the final authority for validating and accrediting representations of its own forces and capabilities in joint and common use M&S. Each DoD Component shall be responsive to the other DoD Components to ensure that its forces and capabilities are appropriately represented in the development of joint and common use M&S.

4.11. Data and data administration for DoD M&S applications shall conform to the policies and procedures for data administration specified in DoD Directive 8320.1 (reference (*h*)).

4.12. Data, information, and information technologies used in support of M&S are corporate assets and shall adhere to the information management policies contained in DoD Directive 8000.1 (*reference (i)*).

5. RESPONSIBILITIES

5.1. The Under Secretary of Defense for Acquisition *and Technology* shall:

5.1.1. Strengthen the uses of M&S in the Department of Defense.

5.1.2. Issue plans, programs, policies, and procedures for DoD M&S in coordination with the DoD Components.

5.1.3. Develop DoD Publications for the management and advancement of M&S, in coordination with the DoD Components.

5.1.4. Establish an EXCIMS to:

5.1.4.1. Advise and assist the *USD(A&T)* in strengthening the uses of M&S in the Department of Defense.

5.1.4.2. Oversee development of DoD M&S plans, programs, policies, procedures, and DoD Directives and DoD Publications.

5.1.4.3. Encourage improved communication and coordination among DoD M&S activities.

5.1.4.4. Identify investments in M&S applications that have high-value return in fulfilling DoD requirements, or that fill gaps in DoD M&S capabilities.

5.1.4.5. Promote joint and cooperative research, development, acquisition, and operation of M&S systems, technologies, and capabilities among the DoD Components.

5.1.4.6. Recommend DoD M&S goals and objectives, and an investment strategy and plan to achieve them.

5.1.4.7. Recommend a DoD Component be designated as a "DoD M&S Executive Agent," as needed.

5.1.4.8. Foster programs to develop and, where applicable, implement DoD M&S interoperability standards and protocols.

5.1.5. Establish a DMSO.

5.1.6. Publish a DoD M&S Master Plan and an Investment Plan, and coordinate those plans with the DoD Components.

5.1.7. Designate a DoD Component as a "DoD M&S Executive Agent" for a common- or general-use M&S application, as needed.

5.1.8. Establish DoD-wide M&S goals and objectives, and an investment strategy to achieve them.

5.1.9. Establish a DoD M&S Information Analysis Center.

5.1.10. Ensure that the Director, Defense Research and Engineering shall:

5.1.10.1. Assist the *USD(A&T)* in strengthening the uses of M&S in the Department of Defense.

5.1.10.2. Chair the EXCIMS and ensure that it meets at least twice each calendar year.

5.1.10.3. Provide EXCIMS-developed recommendations and advice to the *USD(A&T)*.

5.1.10.4. Through the Director, DMSO:

5.1.10.4.1. Encourage improved communication and coordination among DoD M&S activities.

5.1.10.4.2. Function as the DoD focal point for M&S, and ensure that M&S technology development is consistent with other related initiatives.

5.1.10.4.3. Serve as the EXCIMS Secretary and provide support for the EXCIMS during and between meetings.

5.1.10.4.4. As EXCIMS Secretary:

5.1.10.4.4.1. Prepare the EXCIMS meeting agenda.

5.1.10.4.4.2. Coordinate briefings for presentation to the EXCIMS.

5.1.10.4.4.3. Distribute read-ahead materials to principal participants before each EXCIMS meeting.

5.1.10.4.4.4. Maintain a record of each EXCIMS meeting.

5.1.10.4.4.5. Establish an action management and tracking system for M&S action items requiring *USD(A&T)* approval.

5.1.10.4.5. Chair the DoD Modeling and Simulation Working Group (MSWG), and monitor the activities of M&S-related joint, functional, Sub Working Groups (SWGs), and Task Forces (TFs).

5.1.10.4.6. Staff and distribute DoD M&S plans, programs, policies, procedures, and DoD publications.

5.2. The OSD Principal Staff Assistants shall:

5.2.1. Represent their interests to the *USD(A&T)*, the EXCIMS, and the DMSO, as appropriate, on all pertinent matters about M&S.

5.2.2. Provide representatives to the EXCIMS, the MSWG, the SWGs, and TFs, as requested by the *USD(A&T)*.

5.2.3. Plan and provide resources, as needed, to carry out functional M&S responsibilities according to Principal Staff Assistant priorities.

5.2.4. Review, coordinate, and approve DoD M&S plans, programs, policies, procedures, and DoD Publications.

5.2.5. Designate an office to serve as their single point-of-contact on all M&S matters, and for coordination with the EXCIMS and the DMSO.

5.2.6. Provide information about M&S applications, standards, and databases managed by the Principal Staff Assistant to the DoD M&S Information Analysis Center.

5.2.7. Assume DoD-wide responsibility for managing a DoD common- or general-use M&S application, including relevant standards and databases, in response to guidance from the *USD(A&T)* when designated as a "DoD M&S Executive Agent."

5.3. The Heads of the DoD Components shall:

5.3.1. Represent their interests to the *USD(A&T)*, the EXCIMS, and DMSO, as appropriate, on all pertinent matters about M&S.

5.3.2. Provide representatives to the EXCIMS, the MSWG, the SWGs, and TFs, as requested by the *USD(A&T)*.

5.3.3. Plan and provide resources, as needed, to carry out functional M&S responsibilities according to DoD Component priorities.

5.3.4. Review, coordinate, and approve DoD M&S plans, programs, policies, procedures, and DoD Publications.

5.3.5. Designate an office to serve as their single point-of-contact on all M&S matters, and for coordination with the EXCIMS and the DMSO.

5.3.6. Implement a M&S management system for oversight of their own M&S activities, and for internal coordination and communication of DoD M&S issues.

5.3.7. Provide information on M&S applications, standards, and databases managed by the DoD Component to the DoD M&S Information Analysis Center.

5.3.8. Publish a DoD Component M&S Master and Investment Plan.

5.3.9. Ensure that each M&S application, standard, and database used in the DoD Component has a proponent designated to be responsible for its configuration and life-cycle management.

5.3.10. Establish procedures to explore opportunities for joint or cooperative M&S development with the other DoD Components before starting development of a M&S system.

5.3.11. Establish VVA policies, procedures, and guidelines for M&S applications, standards, and databases managed by the DoD Component.

5.3.12. Ensure that M&S applications, standards, and databases are both efficient and effective. The contributions made by the use of particular M&S applications, standards, and databases during developmental and operational testing shall be documented.

5.3.13. Assume DoD-wide responsibility for managing a DoD common- or general-use M&S application, in response to guidance from the *USD(A&T)*, when designated as a "DoD M&S Executive Agent."

5.4. The Chairman of the Joint Chiefs of Staff shall:

5.4.1. Represent the interests of, and integrate the requirements of, the Combatant Commands for joint M&S (JM&S).

5.4.2. Establish the processes to satisfy the needs of the Combatant Commands and the other DoD Components under the purview of the Chairman of the Joint Chiefs of Staff for M&S capabilities.

5.4.3. Provide liaison for the Combatant Commands with the other DoD Components for JM&S matters.

5.4.4. Promote the use of joint doctrine and tactics, techniques, and procedures in JM&S.

5.4.5. Promote the benefits of interoperable JM&S architectures to the Combatant Commands and the Services.

6. PROCEDURES

The *USD(A&T)* shall develop, coordinate, and issue DoD Publications, as needed and authorized, to assist the DoD Components in managing M&S in the Department of Defense.

7. INFORMATION REQUIREMENTS

The *USD(A&T)* may establish information reporting requirements, in accordance with DoD Directive 8910.1 (reference *(j)*) to assist in the management of DoD M&S activities. When possible, existing information systems shall be used or modified rather than creating new systems. The reporting requirement in subparagraphs 5.2.6. and 5.3.7. are exempt from licensing in accordance with paragraph 5.4.2. of DoD 8910.1-M (reference *(k)*).

8. EFFECTIVE DATE AND IMPLEMENTATION

This Directive is effective immediately. Forward one copy of implementing documents to the Under Secretary of Defense for Acquisition *and Technology* within 120 days.

A handwritten signature in black ink, reading "William J. Perry". The signature is written in a cursive, flowing style with a large, looped "P" at the end.

William J. Perry
Deputy Secretary of Defense

Enclosures - 2

- E1. References, continued
- E2. Definitions

E1. ENCLOSURE 1

REFERENCES, continued

- (e) [DoD 5000.2-R](#), *"Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs," March 1996*
- (f) [DoD Directive 7045.14](#), "The Planning, Programming, and Budgeting System (PBS)," May 22, 1984
- (g) Memorandum for the Chairman (MCM) 76-92, "Charter of the Joint Requirements Oversight Council"
- (h) [DoD Directive 8320.1](#), "DoD Data Administration," September 26, 1991
- (i) [DoD Directive 8000.1](#), "Defense Information Management (IM) Program," October 27, 1992
- (j) [DoD Directive 8910.1](#), *"Management and Control of Information Requirements," June 11, 1993*
- (k) [DoD 8910.1-M](#), *"DoD Procedures for Management of Information Requirements," November 1986*
- (l) [DoD Directive 5134.3](#), *"Director of Defense Research and Engineering (DDR&E)," August 31, 1994*

E2. ENCLOSURE 2

DEFINITIONS

E2.1.1. Accreditation. The official certification that a model or simulation is acceptable for use for a specific purpose.

E2.1.2. Common-use M&S. M&S applications, services, or materials provided by a DoD Component to two or more DoD Components.

E2.1.3. Cooperative Development. A project in which two or more DoD Components share in domain research, technical studies, or technology development but that may result in dissimilar M&S applications.

E2.1.4. DoD Modeling and Simulation (M&S) Executive Agent. A DoD Component to whom the *USD(A&T)* has assigned responsibility and delegated authority for the development and maintenance of a specific area of M&S application, including relevant standards and databases, used by or common to many models and simulations.

E2.1.5. Executive Council for Modeling and Simulations (EXCIMS). An organization established by the *USD(A&T)* and responsible for providing advice and assistance on DoD M&S issues. Membership is determined by the *USD(A&T)* and is at the Senior Executive Service, flag, and general officer level.

E2.1.6. General-use M&S Applications. Specific representations of the physical environment or environmental effects used by, or common to, many models and simulations; e.g., terrain, atmospheric, or hydrographic effects.

E2.1.7. Joint M&S. Abstract representations of joint and Service forces, capabilities, equipment, materiel, and services used in the joint environment or by two, or more, Military Services.

E2.1.8. Military Departments. The Department of the Army, the Department of the Navy, and the Department of the Air Force, including their National Guard and Reserve components.

E2.1.9. Military Services. The Army, the Navy, the Air Force, and the Marine Corps. (See definition E2.1.8., above.)

E2.1.10. Model. A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

E2.1.11. Modeling and Simulation (M&S) Interoperability. The ability of a model or simulation to provide services to, and accept services from, other models and simulations, and to use the services so exchanged to enable them to operate effectively together.

E2.1.12. Modeling and Simulation (M&S) Investment Plan. A DoD plan, published under the authority of the *USD(A&T)* and with the coordination of the DoD Components, that establishes short-term (present to 6 years) and long-term (beyond 6 years) programs and funding for joint and common use M&S to achieve the specified goals and objectives outlined in the DoD M&S Master Plan.

E2.1.13. Modeling and Simulation (M&S) Master Plan. A DoD plan, published under the authority of the *USD(A&T)* and with the coordination of the DoD Components, that establishes short-term (present to 6 years) and long-term (beyond 6 years) DoD goals and objectives for the application of M&S for joint and common use within the Department of Defense. It shall also include an assessment of current M&S capabilities, a status report on M&S efforts under development, and a road map that delineates the management, investment, and technical strategies required to achieve DoD M&S objectives.

E2.1.14. Office of the Secretary of Defense (OSD). Includes the immediate Offices of the Secretary and Deputy Secretary of Defense, the Under Secretaries of Defense, the Comptroller of the Department of Defense (C, DoD), the Director of Defense Research and Engineering (*DDR&E*) (*reference (1)*), the Assistant Secretaries of Defense (ASDs), the General Counsel of the Department of Defense (GC, DoD), the Assistants to the Secretary of Defense (ATSDs), the OSD Directors, or equivalents, who report directly to the Secretary or the Deputy Secretary of Defense, and such other staff offices as the Secretary of Defense establishes to assist in carrying out assigned responsibilities.

E2.1.15. Principal Staff Assistants (PSAs). The Under Secretaries of Defense; the C, DoD; *the DDR&E*; the ASDs; the Inspector General of the Department of Defense; the GC, DoD; the ATSDs; and the OSD Directors, or equivalents, who report directly to the Secretary or Deputy Secretary of Defense. (See definition E2.1.14., above.)

E2.1.16. Simulation. A method for implementing a model over time. Also, a technique for testing, analysis, or training in which real-world systems are used, or where real-world and conceptual systems are reproduced by a model.

E2.1.17. Validation. The process of determining the degree to which a model is an accurate representation of the real-world from the perspective of the intended uses of the model.

E2.1.18. Verification. The process of determining that a model implementation accurately represents the developer's conceptual description and specifications.